

μA716C

FIXED-GAIN, LOW DISTORTION AMPLIFIER

FAIRCHILD LINEAR INTEGRATED CIRCUITS

GENERAL DESCRIPTION—The $\mu A716C$ is a fixed-gain, medium power amplifier intended for use as a telephone system channel amplifier, headset amplifier or general purpose audio amplifier. It provides medium output current capability, low distortion, excellent gain stability, and wide bandwidth. Fixed voltage gains of 10, 20, 100 and 200 are available by selecting external taps.

ABSOLUTE MAXIMUM RATINGS:

Supply Voltage
Internal Power Dissipation
Input Voltage
Peak Output Current ($T_A = 25^\circ\text{C}$)
Storage Temperature Range
Operating Temperature Range
Lead Temperature (Soldering, 60 seconds)

27 V

600 mW

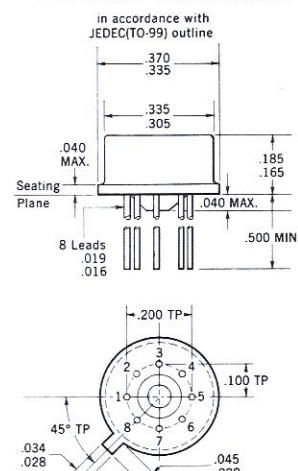
 ± 5 V

100 mA

 -65°C to $+150^\circ\text{C}$ 0°C to $+70^\circ\text{C}$

300°C

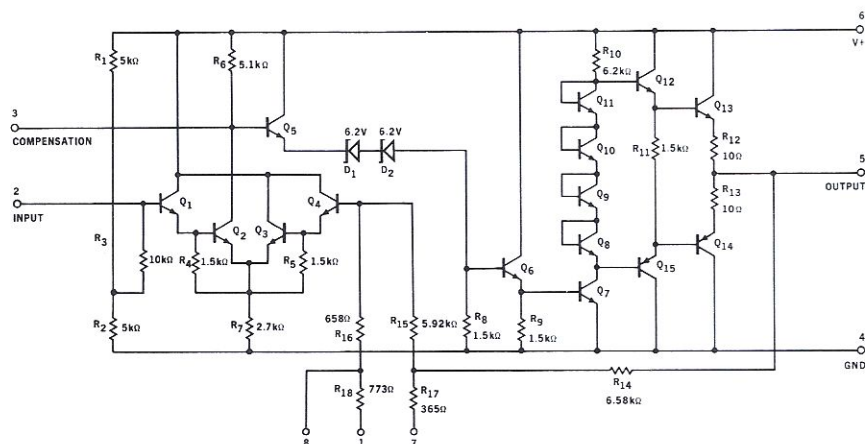
PHYSICAL DIMENSIONS



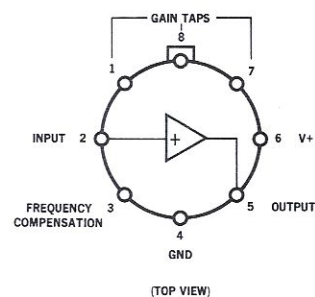
NOTES: Dimensions as per latest J 10 committee
All dimensions in inches
Leads are gold-plated Kovar
Package weight is 1.22 grams

ORDER PART NO. U5B771639X

SCHEMATIC DIAGRAM



CONNECTION DIAGRAM



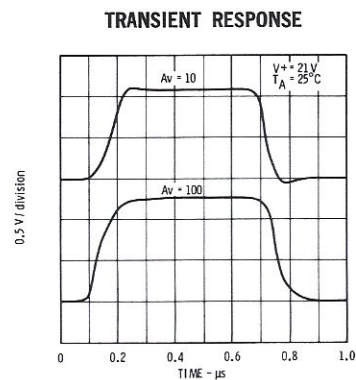
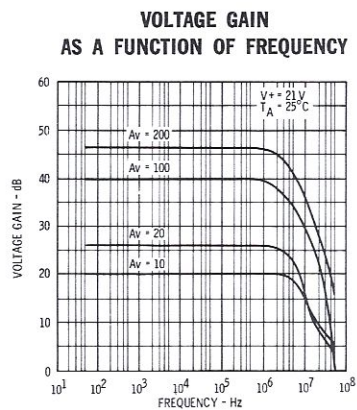
NOTE: Lead No. 4 internally connected to case

FAIRCHILD LINEAR INTEGRATED CIRCUITS $\mu A716C$

ELECTRICAL CHARACTERISTICS ($0^\circ\text{C} \leq T_A \leq 70^\circ\text{C}$, $V^+ = 21\text{V}$ unless otherwise specified)

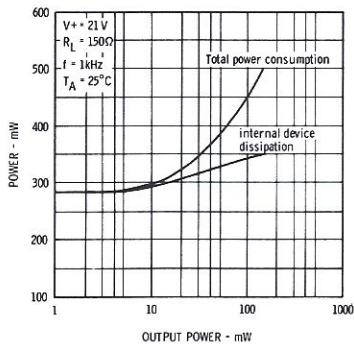
PARAMETER (see definitions)	CONDITIONS	MIN.	TYP.	MAX.	UNITS
Quiescent Power Consumption	$T_A = 25^\circ\text{C}$		280	350	mW
Total Harmonic Distortion	$A_V = 10$, $f = 1\text{ kHz}$, $P_O = 50\text{ mW}$, $R_L = 150\ \Omega$		0.01	0.05	%
	$A_V = 100$, $f = 1\text{ kHz}$, $P_O = 50\text{ mW}$, $R_L = 150\ \Omega$		0.10	0.50	%
Input Noise Voltage	$R_S = 600\ \Omega$, $T_A = 25^\circ\text{C}$, $B_n = 16\text{ Hz to } 150\text{ kHz}$		8.0		μV_{rms}
Output Voltage Swing	$R_L = 150\ \Omega$	10	14		$V_{\text{p-p}}$
	$R_L \geq 5\text{ k}\Omega$	15	17		$V_{\text{p-p}}$
Input Resistance		9.0	11		$\text{k}\Omega$
Output Resistance			1.0		Ω
Voltage Gain	See Table I				
10x		9.0	10	11	
20x		18	20	22	
100x		95	105	115	
200x		185	205	225	
Bandwidth	$T_A = 25^\circ\text{C}$		2.0		MHz
Temperature Stability of Voltage Gain	$T_{\text{ref}} = 25^\circ\text{C}$				
10x			± 0.02	± 0.25	dB
20x			± 0.02	± 0.25	dB
100x			± 0.02	± 0.25	dB
200x			± 0.05	± 0.50	dB

TYPICAL PERFORMANCE CURVES

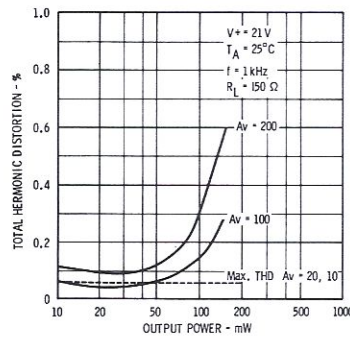


TYPICAL PERFORMANCE CURVES

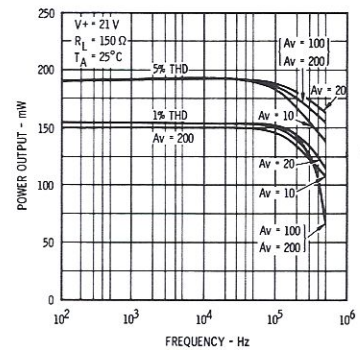
TOTAL POWER CONSUMPTION AND INTERNAL DEVICE DISSIPATION AS A FUNCTION OF OUTPUT POWER



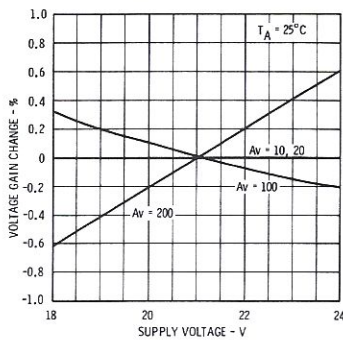
TOTAL HARMONIC DISTORTION AS A FUNCTION OF OUTPUT POWER



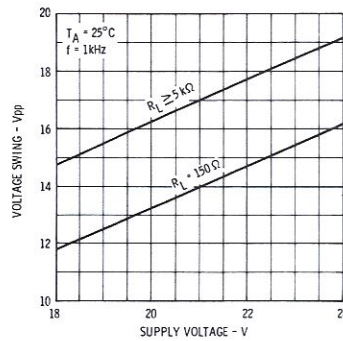
POWER OUTPUT AS A FUNCTION OF FREQUENCY 5% AND 1% THD



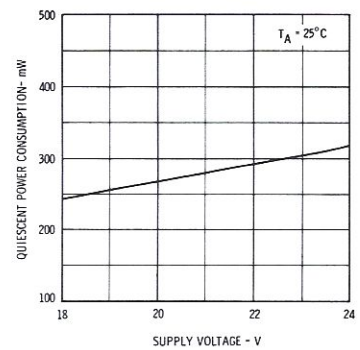
RELATIVE VOLTAGE GAIN AS A FUNCTION OF SUPPLY VOLTAGE



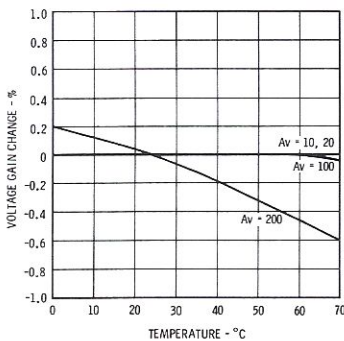
VOLTAGE SWING AS A FUNCTION OF SUPPLY VOLTAGE



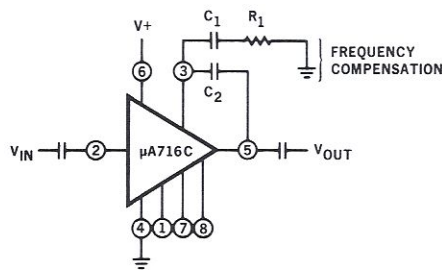
QUIESCENT POWER CONSUMPTION AS A FUNCTION OF SUPPLY VOLTAGE



RELATIVE VOLTAGE GAIN AS A FUNCTION OF AMBIENT TEMPERATURE



CONNECTION DIAGRAM AND COMPONENT TABLE FOR AVAILABLE GAIN OPTIONS



Voltage Gain	C_1	C_2	R_1	Decouple Pins:
10	68 pF	39 pF	75 Ω	1
20	50 pF	27 pF	75 Ω	8
100	None	3 pF	None	1, 7
200	None	3 pF	None	7, 8

TABLE I

DEFINITION OF TERMS

Quiescent Power Consumption — The DC power required to operate the amplifier with no signal applied at the input and the load current equal to zero.

Total Harmonic Distortion — The ratio of the sum of the amplitudes of all signals harmonically related to the fundamental, and the amplitude of the fundamental signal.

Input Noise Voltage — The noise voltage at the output of the amplifier, divided by the amplifier voltage gain.

Output Voltage Swing — The maximum output voltage that may be obtained at the output of the amplifier before saturation occurs.

Input Resistance — The small-signal resistance seen looking into the input terminal of the amplifier.

Voltage Gain — The ratio of the small-signal output voltage to the input voltage of the amplifier.

Temperature Stability of Voltage Gain — The maximum variation of the voltage gain over the specified temperature range.